Virulence Factor 1 and COVID-19

Virulence Factor 1(VF1) could inhibit cytokine storm induced by COVID-19

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Norovirus may be an ally of the immune system. Researchers have not been unable to understand how norovirus can evade immune response by hiding in gut cells. In a test using mice, researchers noticed that in the 1st few days after infection, T cells react strongly and could control the virus, but after 3 days, the T-cells could no longer detect the norovirus. While norovirus remained undetected, T-cell function remained active. I hypothesize that the norovirus regulates the immune system before taking refuge in the gut cells. Noroviruses use two proteins(p48 and p22) to block the host secretory pathway and impede immune responses. The host secretory pathways mediate the intracellular trafficking of proteins, lipids and molecules such as immune mediators like cytokines and chemokines. When viruses are able to subvert the trafficking of the secretory pathway, they are able to enhance their pathogensis. The norovirus virulence factor 1 (VF1) protein antagonizes cytokine induction. This may also serve as a signal for immune cells not to attack the virus. The norovirus minor structural protein VP2 suppresses antigen presentation. Antigen presentation is a key component of adaptive immunity.

The norovirus virulence factor 1 (VF1) protein which antagonizes cytokine induction may serve a hypothesis that the norovirus could reduce both cytokine storm and the pathogenisis of COVID-19. This is an extreme postulate, but even many of the immunosuppresant medications like Janus kinase inhibitors used to reduce cytokine storm have side effects of the same symptomatic manifestations typical of norovirus, which are nausea, vomiting, and diarrhea. However, immunosupressant medications can lower the body's abiity to fight other infections. Norovirus has only been shown to evade immune response, but not inhibit it. In fact, the immune system remains fully functional while the virus hides

undetected in gut cells. The norovirus virulence factor 1 (VF1) antagonizes cytokine induction. It is possible that isolating this protein could lead to advanced research regarding ways to fully inhibit the pathogenesis of COVID-19 as it relates to cytokine storm.

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